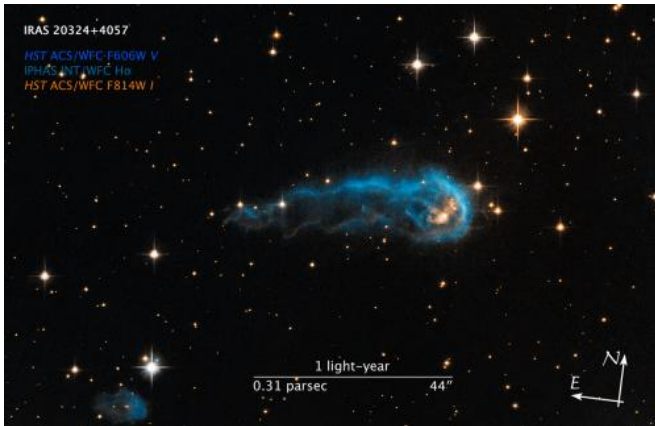


# Hubble sees a cosmic caterpillar

29 August 2013



Credit: NASA, ESA, and Z. Levay (STScI/AURA)

(Phys.org) —This light-year-long knot of interstellar gas and dust resembles a caterpillar on its way to a feast. But the meat of the story is not only what this cosmic caterpillar eats for lunch, but also what's eating it. Harsh winds from extremely bright stars are blasting ultraviolet radiation at this "wannabe" star and sculpting the gas and dust into its long shape.

The culprits are 65 of the hottest, brightest known stars, classified as O-type stars, located 15 light-years away from the knot, towards the right edge of the image. These stars, along with 500 less bright, but still highly luminous B-type stars, make up what is called the Cygnus OB2 association. Collectively, the association is thought to have a mass more than 30,000 times that of our Sun.

The caterpillar-shaped knot, called IRAS 20324+4057, is a protostar in a very early evolutionary stage. It is still in the process of collecting material from an envelope of gas surrounding it. However, that envelope is being eroded by the radiation from Cygnus OB2. Protostars in this region should eventually become young stars with final masses about one to ten times that of our Sun, but if the eroding radiation

from the nearby bright stars destroys the gas envelope before the [protostars](#) finish collecting mass, their final masses may be reduced.

Spectroscopic observations of the central star within IRAS 20324+4057 show that it is still collecting material quite heavily from its outer envelope, hoping to bulk up in mass. Only time will tell if the formed star will be a "heavy-weight" or a "light-weight" with respect to its mass.

This image of IRAS 20324+4057 is a composite of Hubble Advanced Camera for Surveys data taken in green and infrared light in 2006, and ground-based hydrogen data from the Isaac Newton Telescope in 2003, as part of the INT Photometric H-alpha Survey (IPHAS). The object lies 4,500 light-years away in the constellation Cygnus.

Provided by NASA

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